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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,951	07/08/2003	Myeong-Jin Lee	SAM-0433	7111

7590 01/25/2006

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EXAMINER	
NGUYEN, TANH Q	
ART UNIT	**PAPER NUMBER**
2182	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,951	LEE ET AL.	
	Examiner	Art Unit	
	Tanh Q. Nguyen	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The replacement abstract of the disclosure is objected to because it is not submitted on a separate sheet (37 CFR 1.72). Applicant needs to provide one page containing **only** the amended Abstract of the Disclosure, and **nothing else**. The information and instructions relating to the amendments to the specification need to be on a different page (e.g. on page 1 of the response, or on a separate page). Correction is required.

Claim Objections

2. Claims 10-11 are objected to because of the following informalities:

claim 10 recites "the occupancy level" in line 3 and line 4 respectively - the examiner suggests replacing "the occupancy level" in line 3 with "a previous occupancy level" to avoid interpreting the two occupancy levels as being the same occupancy level;

claim 11 recites "the vacancy level" in line 3 and line 4 respectively - the examiner suggests replacing "the vacancy level" in line 3 with "a previous vacancy level" to avoid interpreting the two vacancy levels as being the same vacancy level.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yang et al. (USP 5,546,543)** in view of **Brown et al. (USP 6,397,287)**, and further in view of **Rudin et al. (USP 6,014,722)**, **O'Brien (USP 6,796,961)** and **Treadaway et al. (USP 6,907,048)**.

6. As per claim 12, **Yang** teaches a method of controlling at least one of a transmitting buffer [220, FIG. 2] and a receiving buffer [210, FIG. 2] of a network controller [20, FIG. 2], comprising:

receiving at least one request for access of a system bus [15, FIG. 2] from the transmitting buffer and the receiving buffer [col. 4, lines 6-9]; and

determining an occupancy level of data in the transmitting buffer [investigate whether the number the amount of data resident in the transmit buffer is greater than a second threshold level (col. 4, lines 15-17), hence determining an occupancy level of data in the transmitting buffer] and a vacancy level of data in the receiving buffer

[inquire whether the number of empty data byte locations is greater a first threshold level (col. 4, lines 12-14), hence determining a vacancy level of data in the receiving buffer] and granting access to the system bus to the transmitting buffer or the receiving buffer based on the determination result [col. 4, lines 10-22; col. 6, lines 32-39].

Yang, therefore, teaches the claimed invention except

- for determining a vacancy level (instead of an occupancy level) of the data in the transmitting buffer and an occupancy level (instead of a vacancy level) of data in the receiving buffer; ~~and~~

- except for granting access to the system bus comprising determining a present operational state as an emergency mode when both the transmitting buffer and receiving buffer request access to the system bus, when the occupancy level of the receiving buffer is higher than a threshold occupancy level of the receiving buffer, and when the vacancy level of the transmitting buffer is higher than a threshold vacancy level of the transmitting buffer; and comparing the occupancy level of data in the receiving buffer with the vacancy level of data in the transmitting buffer based on the determination result, and granting access to the system bus to one of the transmitting buffer and the receiving buffer based on the determination result; and

- except for when the operational state is determined as the emergency mode, comparing the occupancy level of data in the receiving buffer with the vacancy level of data in the transmitting buffer, and wherein if the occupancy level of data in the receiving buffer is greater than the vacancy level of data in the transmitting buffer, then determining if the occupancy level of the receiving buffer is increasing by comparing the

occupancy level of the receiving buffer with a previous receiving buffer occupancy level, and wherein if the occupancy level of data in the receiving buffer is not greater than the vacancy level of data in the transmitting buffer, then determining if the vacancy level of the transmitting buffer is increasing by comparing the vacancy level of the transmitting buffer with a previous transmitting buffer vacancy level, and granting access to the system bus to one of the transmitting buffer and the receiving buffer.

Brown teaches for a transmitting buffer of a given size, the vacancy level (TxFree) and the occupancy level (TxUsed) being complementary and may be inferred from one register value [col. 11, line 66-col. 12, line 9]; and for a receiving buffer of a given size, the vacancy level (RxFree) and the occupancy level (RxUsed) being complementary and may be inferred from one register value [col. 14, lines 28-38].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to infer the occupancy level of data in the transmitting buffer (having a given size) from the vacancy level of data in the transmitting buffer when the one register value of the transmitting buffer corresponds to the vacancy level of data in the transmitting buffer, as is taught by Brown - hence determining the vacancy level of data in the transmitting buffer in the process, and to infer the vacancy level of data in the receiving buffer (having a given size) from an occupancy level of data in the receiving buffer when the one register value of the receiving buffer corresponds to the occupancy level of data in the receiving buffer, as is taught by Brown - hence determining the occupancy level of data in the receiving buffer in the process, in order to properly grant access to the system bus (i.e. to use the determination result to grant

access to the system bus to the transmitting buffer or the receiving buffer).

Rudin teaches determining a present operational state as an emergency mode [col. 3, lines 41-44; col. 4, lines 6-9; col. 4, lines 16-18] when both a transmitting buffer [17 - FIGs. 1, 3] and a receiving buffer [16 - FIGs. 1, 3] request access to the system bus [col. 3, lines 54-56; col. 4, lines 6-9], when the occupancy level of the receiving buffer is higher than a threshold occupancy level of the receiving buffer [col. 3, lines 58-63; col. 3, line 66-col. 4, line 2], and when the vacancy level of the transmitting buffer is higher than a threshold vacancy level of the transmitting buffer [col. 3, lines 58-66]. Rudin further teaches arbitrating channels (e.g. one channel associated with the transmitting buffer and another channel associated with the receiving buffer) that have entered the emergency state to determine which of the channels will be granted access to the system bus [col. 4, lines 10-16].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Rudin's teachings into the combination of Yang and Brown in order to determine whether an emergency mode has occurred for the transmitting buffer and the receiving buffer, and to arbitrate the transmitting buffer and the receiving buffer that have entered the emergency mode to properly grant access to the system bus.

The combination of Yang, Brown and Rudin does not teach arbitrating the transmitting buffer and the receiving buffer that have entered the emergency mode comprising comparing the occupancy level of data in the receiving buffer with the vacancy level of data in the transmitting buffer, and granting access of the system bus

to one of the transmitting buffer and the receiving buffer accordingly.

O'Brien teaches an arbiter (hence an arbitration logic) comparing the occupancy level of data in a receiving buffer [occupancy level in a write buffer for device B, e.g. 10% - Table II, col. 4] with the vacancy level of data in a transmitting buffer [vacancy level in a read buffer for device A, e.g. 50% - Table II, col. 4] based on the determination result of the occupancy level in a receiving buffer and the vacancy level in a transmitting buffer, and granting access to a system bus [101, FIG. 1] to one of the transmitting buffer and the receiving buffer based on the determination result [granting access of the system bus to the read buffer for device A, which has the greatest need: col. 3, line 7-col. 5, line 5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate O'Brien's arbitration logic into the combination of Yang, Brown and Rudin, in order to grant access to the buffer that has the greatest need [i.e. a transmitting buffer that is closer to being empty than a receiving buffer being full; or a receiving buffer that is closer to being full than a transmitting buffer being empty].

The combination of Yang, Brown, Rudin and O'Brien therefore discloses the invention except for determining if the occupancy level of the receiving buffer is increasing by comparing the occupancy level of the receiving buffer with a previous receiving buffer occupancy level - when the occupancy level of data in the receiving buffer is greater than the vacancy level of data in the transmitting buffer, and

except for determining if the vacancy level of the transmitting buffer is increasing

by comparing the vacancy level of the transmitting buffer with a previous transmitting buffer vacancy level - when the occupancy level of data in the receiving buffer is not greater than the vacancy level of data in the transmitting buffer.

Treadaway teaches monitoring the current depth of a receiving buffer and adjusting the rate of a transceiver as the amount of occupied storage space increases to reduce the occupancy level of the receiving buffer [col. 21, lines 13-19; FIG. 13]. Treadaway, therefore, implicitly discloses determining if the occupancy level of the receiving buffer is increasing. Furthermore, since it is well known in the art at the time the invention was made to compare a current occupancy level with a previous occupancy level to determine whether the occupancy level is increasing, it would have been obvious to one of ordinary skill in the art at the time the invention was made for Treadaway to make the comparison to determine whether the occupancy level of the receiving buffer is increasing in order to adjust the rate of the transceiver accordingly.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Treadaway's aforementioned teachings because such incorporation would allow for receiving buffer removal rate adjustment - in order to reduce the occupancy level of the receiving buffer. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Treadaway's teachings when the occupancy level of data in the receiving buffer is greater than the vacancy level of the data in the transmitting buffer because the receiving buffer has the greatest need under such condition (as is taught by O'Brien).

Treadaway also teaches monitoring the current depth of a transmitting buffer and

adjusting the rate at which data is retrieved from the transmitting buffer to reduce the vacancy level in the transmitting buffer and prevent the transmitting buffer from becoming empty [col. 19, lines 6-8; col. 19, lines 45-65; FIG. 12]. Treadaway, therefore implicitly teaches determining if the vacancy level of the transmitting buffer is increasing. Furthermore, since it is well known in the art at the time the invention was made to compare a current vacancy level with a previous vacancy level to determine whether the vacancy level is increasing, it would have been obvious to one of ordinary skill in the art at the time the invention was made for Treadaway to make the comparison to determine whether the vacancy level of the transmitting buffer is increasing in order to adjust the rate at which data is retrieved from the transmitting buffer accordingly.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Treadaway's aforementioned teachings because such incorporation would allow for transmitting buffer removal rate adjustment - in order to reduce the vacancy level of the transmitting buffer. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Treadaway's teachings when the occupancy level of data in the receiving buffer is not greater than the vacancy level of the data in the transmitting buffer because the transmitting buffer has the greatest need under such condition (as is taught by O'Brien).

7. As per claim 13, Rudin teaches when the present operational state does not correspond to the emergency mode, the arbitration is carried out using an assigned priority level [col. 4, lines 18-21].

O'Brien teaches the occupancy level of the receiving buffer being compared with the vacancy level of the transmitting buffer, the receiving buffer being granted access to the system bus when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, and the transmitting buffer being granted access to the system bus when the vacancy level of the transmitting buffer is higher than the occupancy level of the receiving buffer [col. 3, line 7-col. 5, line 5]. In essence, O'Brien teaches arbitrating for access to the system bus comprising granting access to the system bus to the buffer (either the transmitting buffer, or the receiving buffer) having the greatest need for avoiding an underrun (for a transmitting buffer) or overrun (for a receiving buffer).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate O'Brien arbitration logic - to provide an assigned priority level when the present operational state does not correspond to the emergency mode, in order to grant access of the system bus to one of the transmitting and receiving buffers that has the greatest need of avoiding an underrun (for a transmitting buffer) or an overrun (for a receiving buffer).

8. As per claim 14, Rudin teaches when the present operational state corresponds to the emergency mode, arbitrating the channels that have entered the emergency state to determine which of the channels will be granted access to the system bus [col. 4, lines 10-16]. O' Brien teaches the occupancy level of the receiving buffer being compared with the vacancy level of the transmitting buffer, and

when the occupancy level of the receiving buffer is higher than the vacancy level

of the transmitting buffer, the receiving buffer is granted access to the system bus if the occupancy level of the receiving buffer is increasing and if the vacancy level of the transmitting buffer is not increasing [col. 3, line 7-col. 5, line 5] - as the receiving buffer still has the greatest need under such condition; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer (e.g. when the occupancy level of the receiving buffer is less than or equal to the vacancy level of the transmitting buffer), the transmitting buffer is granted access to the system bus if the vacancy level of the transmitting buffer is increasing and if the occupancy level of the receiving buffer is not increasing [col. 3, line 7-col. 5, line 5] - as the transmitting buffer has the greatest need under such condition.

9. As per claim 15, O'Brien teaches when the occupancy level of the receiving buffer is higher than the vacancy level of the transmitting buffer, the transmitting buffer is granted access to the system bus if the occupancy level of the receiving buffer is not increasing and if the vacancy level of the transmitting buffer is increasing to a level that is higher than the occupancy level of a receiving buffer [col. 3, line 7-col. 5, line 5] - as the transmitting buffer has the greatest need under such condition; and

when the occupancy level of the receiving buffer is not higher than the vacancy level of the transmitting buffer (i.e. when the occupancy level of the receiving buffer is equal to the vacancy level of the transmitting buffer), the receiving buffer is granted access to the system bus if the vacancy level of the transmitting buffer is not increasing and if the occupancy of the receiving buffer is increasing [col. 3, line 7-col. 5, line 5] - as the receiving buffer has the greatest need under such condition.

10. As per claim 16, the combination of Yang, Brown, Rudin, O'Brien and Treadaway, teaches the method for controlling a transmitting and a receiving buffer of a network controller, hence teaches a program for executing the method using a computer, the program inherently being recorded on a computer readable recording medium for execution on a computer.

11. As per claim 17, Yang teaches granting access to the system bus comprising receiving the request for access to the system bus from one of the transmitting and receiving buffers and granting access to the system bus to the one of the transmitting and receiving buffers sending the request [col. 3, lines 46-48].

12. As per claim 8, the combination of Yang, Brown, Rudin, O'Brien and Treadaway above with respect to claim 12, teaches a network controller having transmitting and receiving buffers, comprising an internal arbiter [25, FIG. 2 - Yang] monitoring the transmitting and receiving buffers, and arbitrating access to a system bus between the transmitting and receiving buffers in response to requests for access to the system bus from the transmitting and receiving buffers (see Yang portion of rejection of claim 12 above), wherein the internal arbiter comprises:

an emergency mode determination circuit receiving an occupancy level of data in the receiving buffer and a vacancy level of data in the transmitting buffer, determining whether a present operational state corresponds to an emergency mode as a function of the occupancy level and the vacancy level, and outputting an emergency mode signal (see Brown and Rudin portions of rejection of claim 12 above);

a first determination circuit for determining if the occupancy level of the receiving

buffer is increasing, and outputting a result of the determination as a first signal; a second determination circuit for determining if the vacancy level of the transmitting buffer is increasing and outputting a result of the determination as a second signal (see Treadaway portion of rejection of claim 12 above);

a comparing circuit comparing the vacancy level of the transmitting buffer with the occupancy level of the receiving buffer and outputting a comparison result (see O'Brien portion of rejection to claim 12 above); and

an implicit logic circuit outputting a permission signal to the receiving buffer or the transmitting buffer in response to the first signal, the second signal, and the comparison result, the permission signal granting access to the system bus to one of the transmitting buffer and receiving buffer (see rejection to claim 12 above).

13. As per claim 9, the combination above with respect to claim 12 (in particular Rudin), teaches determining an emergency mode comprising: comparing the occupancy level of the receiving buffer with a threshold occupancy level, comparing the vacancy level of the transmitting buffer with a threshold vacancy level, and determining an operational state as an emergency mode when the vacancy level exceeds the threshold vacancy level and the occupancy level exceeds the threshold occupancy level - hence teaches the claimed invention except for specifically using an AND gate to determine the operational state. Since it was known in the art at the time the invention was made that an AND gate is a simple and most appropriate circuit for outputting a logic "true" only when each of the inputs has a logic "true", it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an AND gate as the

circuit for determining the operational state and outputting output logic "true" representing an emergency mode only when a logic "true" representing the vacancy threshold level being exceeded and a logic "true" representing the occupancy threshold level being exceeded, are received as inputs to the AND gate because the AND gate is a simple and appropriate circuit for such operation.

14. As per claims 10-11, the combination above with respect to claim 12 (in particular Treadaway) discloses the claimed invention except for storing a previous occupancy level (or vacancy level) in a register and using the register in a comparison operation to determine whether the occupancy level (or vacancy level) has increased. Since it was known in the art at the time the invention was made to store a first value in a register and comparing the value in the register with a second value to determine whether the second value is greater than the first value, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store the previous occupancy level (or vacancy level) in a register and comparing the occupancy level (or vacancy level) in the register with the current occupancy level (or vacancy level) in order to determine whether the occupancy level (or vacancy level) has increased.

Response to Arguments

15. Applicant's arguments with respect to claims 8-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tanh Quang Nguyen whose telephone number is (571) 272-4154 and whose e-mail address is tanh.nguyen36@uspto.gov. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Huynh, can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for After Final, Official, and Customer Services, or (571) 273-4154 for Draft to the Examiner (please label "PROPOSED" or "DRAFT").

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